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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/601,866	06/23/2003	Anand G. Dabak	TI-28441A	7204
23494	7590	12/12/2005	EXAMINER	
TEXAS INSTRUMENTS INCORPORATED P O BOX 655474, M/S 3999 DALLAS, TX 75265			CORRIELUS, JEAN B	
			ART UNIT	PAPER NUMBER
			2637	

DATE MAILED: 12/12/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/601,866	Applicant(s) DABAK ET AL.	
	Examiner Jean B. Corrielus	Art Unit 2637	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 October 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 26-45 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 26-45 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities: Page 5, line 14, "S1" should be replaced by "S2". In addition, Equation 6, "S1" should be replaced by "S2" so as to be consistent with fig. 2.

Claim Objections

2. Claims 26-45 are objected to because of the following informalities: claim 26, line 3, " a complement of" should be inserted after "and". Claim 27, line 3, "complement of a" should be deleted. Claim 28, line 3, "complement of the " should be inserted before conjugate; line 3, "complement of" should be deleted. As per claim 29, see claim 28; as per claims 30, 31, 35, 36, see claim 26. as per claim 37, see claim 27. as per claim 38, see claim 28. as per claim 39, see claim 29. as per claim 40, see claim 30, as per claim 41, see claim 31. as per claim 43 see claim 36. as per claim 44, see claim 36. Note that any claim whose base claim is objected is likewise objected. Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 26-45 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 26-45 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential elements, such omission amounting to a gap between the elements. See MPEP § 2172.01. The original disclosure, see for instance fig. 3 and equations 5 and 6, that requires the "correction circuit" receives a first signal comprising a first symbol transmitted from a first antenna at a first time and a complement of a conjugate of a second symbol transmitted from a second antenna at the first time and receives a second signal comprising the second symbol transmitted from a first antenna at a second time and a conjugate of the first symbol from the second antenna at the second time, the correction circuit producing a first symbol estimate in response to the first symbol and the complement of the conjugate of the second symbol and producing a second symbol estimate in response to the second symbol and the conjugate of the first symbol. Hence, the claimed limitations "first symbol and second symbol" only correspond to the first signal, (i. e. signal on line 610 of fig 3 or equation 5). However, the signal on line 614 of the correction circuit has been omitted. Such signal is required in order for the correction circuit fig. 3 to determine the first symbol estimate and the second symbol estimate. The omitted elements are shown in the following proposed claimed amendment in underlining :

--26. (Amended) An apparatus, comprising:

a correction circuit coupled to receive a first signal comprising a first symbol transmitted from a first antenna at a first time and a complement of a conjugate of a second symbol transmitted from a second antenna at the first time and to receive a second signal comprising the second symbol transmitted from a first antenna at a second time and a conjugate of the first symbol from the second antenna at the second time, the correction circuit producing a first symbol estimate in response to the first symbol and the complement of the conjugate of the second symbol and producing a second symbol estimate in response to the second symbol and the conjugate of the first symbol; and

a combining circuit coupled to receive a plurality of symbol estimates including the first symbol estimate and the second symbol estimate, the plurality of symbol estimates corresponding to a respective plurality of signal paths, the combining circuit producing a first symbol signal and a second symbol signal in response to the plurality of symbol estimates. --

Claim 27 inherits the same problem as claim 26. in addition, if claim 26 is amended in the manner suggested, claim 27 will be redundant and therefore should be canceled.

As per claim 28, see claim 27.

Claim 29 inherits the same problem as claim 26. it is as well rejected. In addition, line 1, "27" should be changed to -26—if claim 27 were to be canceled as suggested by the examiner. .

Claim 36 should be amended as follow:

36. (Amended) A method comprising the steps of:

receiving a first signal comprising a first symbol transmitted from a first antenna at a first time and a complement of a conjugate of a second symbol transmitted from a second antenna at the first time;

receiving a second signal comprising the second symbol transmitted from a first antenna at a second time and a conjugate of the first symbol transmitted from the second antenna at the second time,

producing a first symbol estimate in response to the first symbol and the complement of the conjugate of second symbol;

producing a second symbol estimate in response to the second symbol and the conjugate of the first symbol;

receiving a plurality of symbol estimates including the first symbol estimate and the second symbol estimate, the plurality of symbol estimates corresponding to a respective plurality of signal paths; and

producing a first symbol signal and a second symbol signal in response to the plurality of symbol estimates.

Claim 37 should be canceled because it would be redundant.

Claim 38 should be canceled because it would be redundant.

Claims 43 and 44 should be amended as follow so as to be consistent with base claim above:

--43. (Amended) The method of claim 36 wherein the steps of receiving a first signal comprising a first symb transmitted from a first antenna at a first time and a

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complement of a conjugate of second symbol transmitted from a second antenna at the first time, receiving a second signal comprising the second symbol transmitted from a first antenna at a second time and a conjugate of the first symbol from the second antenna at the second time, [and] said producing a first symbol estimate in response to the first symbol and the complement of the conjugate of second symbol; and said producing a second symbol estimate in response to the second symbol and the conjugate of the first symbol, occur in a correction circuit.

44. (Amended) The method of claim 36, wherein the steps of receiving a plurality of symbol estimates including the first symbol estimate and the second symbol estimate, the plurality of symbol estimates corresponding to a respective plurality of signal paths, and producing a first symbol signal and a second symbol signal in response to the plurality of symbol estimates, occur in a combining circuit. –

Note that any claim whose base claim is likewise rejected.

Terminal Disclaimer

5. The terminal disclaimer filed on 10/24/05 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of U.S. Patent No. 6,643,338 has been reviewed and is accepted. The terminal disclaimer has been recorded.

Double Patenting

5. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

4. Claims 26-45 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 34-65 of copending Application No. 10/659,906. Although the conflicting claims are not identical, they are not patentably distinct from each other because claim 26 is substantially encompassed by claim 34 except for some minor modifications. Claim 26 is likewise encompassed by claim 50.

Claim 27 is substantially encompassed by claims 35 and claim 51.

Claim 28 is substantially encompassed by claim 36 and claim 52

Claim 29 is substantially encompassed by claim 37 and claim 53

Claim 30 is substantially encompassed by claim 38 and claim 54

Claim 31 is substantially encompassed by claim 39 and claim 55

Claim 32 is substantially encompassed by claim 40 and claim 56

Claim 33 is substantially encompassed by claim 41 and claim 57

As per claim 35, it would have been obvious to one skill in the art to couple the correction circuit to an antenna in order to receive the signals transmitted by the transmitter circuit.

Claim 36 is substantially encompassed by claim 6, as claim 6 is an apparatus claim and claim 36 is the equivalent method claim. It would have been obvious to one skill in the art to claim the invention so as to present an alternate way to claim the invention.

Claim 36 is also substantially encompassed by claim 42 and claim 58

Claim 37 is substantially encompassed by claim 43 and claim 59

Claim 38 is substantially encompassed by claim 44 and claim 60

Claim 39 is substantially encompassed by claim 45 and claim 61

Claim 40 is substantially encompassed by claim 46 and claim 62

Claim 41 is substantially encompassed by claim 47 and claim 63

Claim 42 is substantially encompassed by claim 48 and claim 64

Claim 43 is substantially encompassed by claim 34

Claim 44 is substantially encompassed by claim 34

Claim 45 is substantially encompassed by claim 53 and claim 65

It would have been obvious to one skill in the art to claim the invention as shown in the pending application as a variation of claims for esthetic reasons.

As per claim 34 it would have been obvious to one skill in the art to incorporate a first and second antennas in the transmitting antennas so as to create signal diversity.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 26-45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Alamouti et al.

As per claim 26, Alamouti et al discloses a circuit fig. 4 having a correction circuit (53 and 54) coupled to receive a first input signal 51 from a first antenna 31 of an external source 10 and a second input signal 52 from a second antenna of an external source 10, the first and the second input signals corresponding to the same datum see table 1 s0 and s0*, the correction circuit (53 and 54) producing a first symbol estimate in response to the first symbol and the second symbol estimate see col. 4, lines 25-27 and col. 6, lines 63-65, combining circuit 55 coupled to receive a plurality of symbol estimates from estimator 53 including the first symbol estimate and coupled to receive a plurality of second symbol estimates including the second symbol estimate from estimator 54, the plurality of first symbol estimates corresponding to a respective plurality of signal paths see fig. 4 the combining circuit 55 producing a first symbol signal and a second symbol signal in response to the plurality of first and second

symbol estimates see fig. 4, the plurality of symbol estimates corresponding to a respective plurality of signal paths and producing a first symbol signal in response to the plurality of symbol estimates see output of detector 56. Alimouti further teaches the plurality of signals including a first signal s_0 transmitted as a first time and the conjugate of the second signal s_1 transmitted at a second time rather than the first time. However, configuring the encoder so as to output the conjugate of the second signal to the antenna for transmission at the first time rather than the second time would have been obvious to one skill in order to satisfy coding requirements.

As per claim 27, Alimouti teaches transmitting the second symbol S_1 and the conjugate of the first symbol at different time rather than the same second time. However, as indicated above in reference to claim 34, such limitation does not involve any inventive step and would have been obvious to one skill in the art for the reason set forth in claim 26.

As per claim 28, the correction circuit produces the first symbol estimate and the second symbol estimate in response to the first transmitted symbol the second transmitted symbol the conjugate of the second and the complement conjugate of the first symbol see col. 7, lines 19-51.

As per claim 29 see claim 28 and in addition, the first and second symbol are generated in response to a first estimate and second estimate see col. 7, lines 19-51.

As per claim 30, the first and the conjugate of the second symbol are received over a common channel. See fig. 3.

As per claim 31, it would have been obvious to one skilled in the art to configure Alamouti to receive the first and second signals over a common frequency band so as to reduce the complexity of the receiver, as signals received from different frequency bands would have required a more complex receiving circuit.

As per claim 32, the plurality of symbol estimates corresponds to one of the first and second symbols see col. 7, lines 40-51.

As per claim 33, it would have been obvious that the combiner would have been a rake combiner so as to allow the receiver to combine multipath signals from a plurality of rake receivers.

As per claim 34, see fig. 4.

As per claim 35, see fig. 4.

As per claim 36, see claim 26.

As per claim 37, see claim 27.

As per claim 38, see claim 28.

As per claim 39 see claim 29.

As per claim 40, see claim 30.

As per claim 41, see claim 31.

As per claim 42, see claim 32.

As per claim 43, see claim 26.


As per claim 44, see claim 26.

As per claim 45 see claim 33.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jean B. Corrielus whose telephone number is 571-272-3020. The examiner can normally be reached on Maxi-Flex.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jay Patel can be reached on 571-272-2988. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Jean B Corrielus
Primary Examiner
Art Unit 2637

12-9-05